

REMARKS

Reconsideration and the timely allowance of the pending claims, in view of the following remarks, are respectfully requested.

In the Office Action of March 28, 2007, the Examiner rejected claims 1, 2, 4, and 6-8, under 35 U.S.C. § 103(a), as allegedly being unpatentable over Basceri '374 (U.S. Patent Application Publication No. 2002/0132374) in view of Mitani '780 (Japanese Patent Publication No. JP 3-281780); rejected 1, 2, 4, and 6-8, under 35 U.S.C. § 103(a), as allegedly being unpatentable over Ingle'940 (U.S. Patent No. 6,905,940) in view of Mitani '780.

By this Amendment, independent claim 1 has been amended and claim 4 has been cancelled. Applicants submit that no new matter has been introduced. Accordingly, after entry of this Amendment, claims 1-2 and 6-13 will remain pending of which claims 1-2 and 6-8 are currently submitted for examination.

Insofar as the prior art rejections are still deemed relevant in view of the claim changes, Applicants respectfully traverse the prior art rejections, under 35 U.S.C. §103(a), for the following reasons:

I. Prior Art Rejections.

As indicated above, independent claim 1 positively recites a controller constructed and arranged to control the position control assembly such that a distance between the wafer and the gas supply assembly is varied to *a plurality of predefined distances corresponding to predefined stages* of the deposition process, wherein the controller controls the position control assembly such that the distance between the wafer and the gas supply assembly *is successively increased to achieve the predefined distances in accordance with the predefined stages of the deposition process*, and wherein the controller controls the control valve to direct *the supply of the process gas from the first section of the gas supply assembly to the second section of the gas supply assembly in accordance with the predefined stages of the deposition process*.

Such features are amply supported by the embodiments disclosed in the Specification. (See, e.g., Specification: par. [0022]-[0025]). By way of example, the disclosed embodiments

provide that chuck 20 is raised and lowered during the deposition process as the process time is divided into different process stages (e.g., initial, intermediate, and end stages) and the distance between the wafer and the gas supply is varied according to the process stage. The raising and lowering of the chuck 20 varies the distance between the shower head 10 and the wafer W. In addition, the process gas is injected into the process chamber 12 only through the first section 10a in the initial stage, whereas it is injected into the process chamber 12 through the first section 10a and the second section 10b in the intermediate and end stages. In this manner, the deposition layer does not become thicker at edges of the wafer W than at a center portion thereof.

With this said, despite the Examiner's contentions, there is nothing in the asserted references that teach each and every element of the independent claims, including the features identified above. In particular, the Basceri '374 reference describes a CVD system 50 with a barium-containing organometallic precursor source 52, a strontium-containing organometallic precursor source 53, and a titanium-containing organometallic precursor source 54, which are controlled by flow controllers 62-64 to feed the vaporizer 56. (See, Basceri '374: par. [0043].) In addition, Basceri '374 merely discloses that either the delivery device 72 or the substrate assembly 10 may be moved to adjust the distance D. (See, Basceri '374: par. [0054].)

Given such a paucity of disclosure regarding the distance D between the delivery device 72 and the substrate assembly 10, there is no conceivable way that Basceri '374 could be construed as teaching or suggesting varying the distance between the wafer and the gas supply assembly to *a plurality of predefined distances corresponding to predefined stages* of the deposition process - or, for that matter, that the controller controls the position control assembly such that the distance between the wafer and the gas supply assembly *is successively increased to achieve the predefined distances in accordance with the predefined stages of the deposition process*, as required by claim 1.

Equally notable, is the fact that there is nothing in Basceri '374 that remotely teaches or suggests that the controller controls the control valve to direct *the supply of the process gas from*

the first section of the gas supply assembly to the second section of the gas supply assembly in accordance with the predefined stages of the deposition process, as also required by claim 1.

Applicants further submit that none of the references of record cure the deficiencies identified above relative to the Basceri '374 reference. For example, the Ingle'940 reference, discloses a CVD system 10 that includes a gas delivery system 89, a vacuum system 88, and a control system 53. (Ingle'940: col. 4, lines 19-25.) The CVD system 10 includes a gas distribution plate 20 and a heater 25 on which a wafer is placed. (Ingle'940: col. 4, lines 26-33.) Ingle'940 merely discloses that heater 25 may be moved between a lower position and an upper position and that the height of the heater 25 may be varied during processing to affect the rate of deposition. (Ingle'940: col. 4, lines 33-38 and 45-54.)

Much like Basceri '374, the discussion of the heater height in Ingle'940 does not, in any way, teach or suggest varying the distance between the wafer and the gas supply assembly to *a plurality of predefined distances corresponding to predefined stages* of the deposition process, as required by claim 1. Nor does it remotely teach or suggest that the controller controls the position control assembly such that the distance between the wafer and the gas supply assembly *is successively increased to achieve the predefined distances in accordance with the predefined stages of the deposition process*, as also required by claim 1. Moreover, Ingle'940 is incapable of teaching or suggesting that the controller controls the control valve to direct *the supply of the process gas from the first section of the gas supply assembly to the second section of the gas supply assembly in accordance with the predefined stages of the deposition process*, as also required by claim 1.

Regarding the Mitani '780 reference, Applicants submit that Mitani '780 describes a CVD device that includes a gas feeding system, a reactor, and a gas exhaust system. The gas feeding system consists of a heatable susceptor 16 and a gas nozzle 17 having three concentric gas hole feeding groups 21, 22, 23 that are respectively connected to three distinct gas systems (a), (b), (c). (Mitani '780 (translation): page 5, lines 2-10.) Mitani '780 clearly discloses that each of the gas hole feeding groups 21, 22, 23 dispense a different type of process gas contained within gas systems (a), (b), (c). For example, Mitani '780 provides that gas hole feeding group

21 dispenses WF₆, feeding group 22 dispenses SiH₄, and feeding group 23 dispenses H₂. (Mitani '780 (translation): page 5, lines 15-16.)

In so doing, Mitani '780 clearly fails to teach or suggest varying the distance between the wafer and the gas supply assembly to *a plurality of predefined distances corresponding to predefined stages* of the deposition process, as required by claim 1. Mitani '780 also clearly fails to teach or suggest that the controller controls the position control assembly such that the distance between the wafer and the gas supply assembly *is successively increased to achieve the predefined distances in accordance with the predefined stages of the deposition process*, as also required by claim 1.

In addition, Mitani '780 fails to teach or suggest that the controller controls the control valve to *direct the supply of the process gas from the first section of the gas supply assembly to the second section of the gas supply assembly in accordance with the predefined stages of the deposition process*, as also required by claim 1. In fact, by virtue of disclosing that each of gas hole feeding groups dispense a different type of process gas, not only does Mitani '780 fail to teach this claim limitation, it actually teaches away from it.

For at least these reasons, Applicants submit that none of the references, whether alone or in reasonable combination, teach each and every element recited by independent claim 1. Accordingly, claim 1 is patentable over these references. And, because claims 2 and 6-8 depend from independent claim 1, respectively, claims 2 and 6-8 are patentable at least by virtue of dependency as well as for their additional recitations.

II. Conclusion

All matters having been addressed and in view of the foregoing, Applicant respectfully requests the entry of this Amendment, the Examiner's reconsideration of this application, and the immediate allowance of all pending claims.

Applicant's representative remains ready to assist the Examiner in any way to facilitate and expedite the prosecution of this matter. If any point remains in issue which the Examiner

feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975.

The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

**PILLSBURY WINTHROP
SHAW PITTMAN LLP**

By: 

E. R. HERNANDEZ
Reg. No. 47641
Tel. No. 703.770.7788
Fax No. 703.770.7901

Date: June 26, 2007
P.O. Box 10500
McLean, VA 22102
(703) 770-7900